

## 2 A Spanner in the Works

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### Is it time to throw out your old textbooks as researchers retrieve 40,000 year old DNA?

Seven years ago, *Homo floresiensis* caused a stir with its discovery on the island of Flores, Indonesia. If the hobbit caused a stir, the recovery of a single finger bone has the potential to cause a maelstrom. With the discovery of these two forms of human, the number of species of human around at just 40,000 years ago comes to four. As far as we know, *Homo sapiens* is the only one left.

The bone was found at Denisova Cave in the Altai Mountains, Siberia during excavations in 2008 (Krause et al 2010). The area is one of considerable activity during the Upper Palaeolithic with mtDNA evidence for Neanderthals (Krause et al 2007) and modern humans (Derevianko et al 2000, Goebel et al 1993). Throw in a third species of human, and the picture begins to get rather crowded.

The report in *Nature* describes, with a glorious pun that I only wish I could have coined myself, how the fossil finger points to a new species of human. The implications of this discovery could be great. If it really does represent a unique species, then all our textbooks are now outdated. Neanderthals were not the only species to share Eurasia with modern humans. They were also not the only ones to suspiciously ‘disappear’ once modern humans arrived either.

Johannes Krause of the Max Planck Institute, who’s previous work has involved a comparison of Neanderthal, human and ape DNA (Green et al 2006) spoke to Reuters news agency about the find. Here, we find no certainty that the finger bone actually represents a new species of human: It really just looked like something we had never seen before. . . it was a sequence that looked something like humans but really quite different (Fox 2010). However, it is pointed out that mtDNA alone does not provide enough evidence to verify a new species as it could be the result of interbreeding with Neanderthals, *Homo erectus*, archaic modern humans or another unknown species of human (Dalton 2010, 473).

The bone was found in a stratigraphic band dated to between 30,000 and 48,000 years ago in the same layer as a fragment of polished bracelet (ibid, 473). The mtDNA extracted from the specimen differs from *Homo sapiens* at 385 nucleotide positions. Neanderthals differ at only 202, suggesting that our new sibling branched from the family tree around 1 million years ago (ibid, 472).

### What exactly does this mean for our theories?

There have traditionally been two camps when it comes to explaining how humans came to be present across the globe, the multi-regional theory which hypothesises that many different types of human evolved independently of each other in *Homo sapiens*, and the single origin theory which theorises a modern, recent point of origin from which *Homo sapiens* spread and replaced other archaic forms of human. The discovery of *Homo floresiensis* and now this discovery could possibly sound the death knell for multi-regionalists.

At the moment, it is uncertain whether the findings at Denisova Cave really do represent another species of human. As Willerslev points out, mtDNA evidence

alone is not enough to argue for a new species of modern human, nuclear DNA is the next step for this specimen (Dalton 2010). Once these results are in, we may have to re-examine our theories of Neanderthal extinction and modern human colonisation of Eurasia and Europe.

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